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7.1 Wastewater Management

7.1.1 NPDES Wastewater Discharge Permit

The National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. It is authorized under the Clean Water Act (CWA). Not complying with permit limits on wastewater flow can lead to degraded water quality making surface waters unsafe for drinking, fishing, swimming and other activities. NPDES wastewater permits are issued by the [NPDES Wastewater Permitting Branch](#) within Division of Water Resources (DWR). These permits are reviewed and potentially renewed every 5 years. There are 7 NPDES discharge permits issued in the Chowan River basin (Table 7-1).

Table 7-1 NPDES Permits – Chowan River Basin

Permit Number	Facility Name	Owner Type	County	Permit Type	Class	Permit Flow GPD	Receiving Stream
NC0033782	Gatesville Elementary School	Government - County	Gates	Discharging 100% Domestic < 1MGD	Minor	5,000	Bennetts Creek (Merchants Millpond)
NC0033804	T.S. Cooper Elementary School	Government - County	Gates	Discharging 100% Domestic < 1MGD	Minor	4,000	Raynor Swamp (Hunters Millpond)
NC0043974	Buckland Elementary School	Government - County	Gates	Discharging 100% Domestic < 1MGD	Minor	6,000	Cole Creek (Lilleys Millpond)
NC0088561	Ahoskie WWTP	Government - Municipal	Hertford	Municipal Wastewater Discharge, Large	Major	1,300,000	Ahoskie Creek
NC0089541	Ashton Lewis Lumber Co.	Non - Government	Gates	Industrial Process & Commercial WW Discharge	Minor	Null	Bennetts Creek (Merchants Millpond)
NC0032719*	Valhalla WTP	Non - Government	Chowan	Water Plant and Water Conditioning Discharge	Minor	Not limited	Rockyhock Creek (Bennett Millpond)*
NC0089516	Perdue Agribusiness LLC (Cofield)	Industrial Process & Commercial Wastewater Discharge	Hertford	NCCW, BB, RO reject	Minor	Not limited	Unnamed Tributary Deep Creek
<p>*New outfall under construction (as of January 2020 permit renewal) – discharge location will be in the Chowan River [AU# 25b], HUC-030102030701, and old DWR subbasin number 03-01-03. NCCW – Non-Contact Cooling Water; BB – Boiler Blowdown; RO – Reverse Osmosis;</p>							

As part of their NPDES permit, some facilities are required to monitor whole effluent toxicity (WET). Acute and/or chronic toxicity tests are used to determine toxicity of the discharge to sensitive aquatic species (usually the fathead minnow, *Pimephales promelas*, or the water flea, *Ceriodaphnia dubia*). Results of the test can be used to help predict the impacts of the discharge to a receiving stream. DWR's [Aquatic Toxicology Branch \(ATB\)](#) in the Water Sciences Section maintains a compliance summary for all facilities required to perform WET tests and provides monthly updates of the information to regional offices as well as the central office. The Ahoskie WWTP is the only permitted facility which requires WET testing and they have demonstrated compliance since 2011. The other six facilities in the basin are not required to conduct WET testing.

7.1.2 Pretreatment, Emergency Response and Collections System (PERCS)

The Federal and State Pretreatment Program gives regulatory authority for EPA, states, and municipal governments to control the discharge of industrial wastewater into municipal wastewater treatment plants (WWTP) or publicly owned treatment works (POTW). The objectives of the pretreatment program are to (1) prevent pass-through, interference, or other adverse impacts to a POTW, employees, or the environment; (2) promote the beneficial reuse of biosolids; and (3) assure all categorical pretreatment standards are met. Pretreatment programs have been absorbed into the [NPDES Wastewater Permitting Branch](#) managed by the DWR.

7.1.3 Non-Discharge Permitting and Land Application of Wastewater Effluent

The [Non-Discharge Branch \(NDB\)](#) is responsible for the permitting of facilities that land apply residuals, reclaimed water, and wastewater effluent. Residuals, often refer to as biosolids, treated sludge, or sewage sludge, which are generated during wastewater treatment, water treatment, and air pollution control. The program has operational and monitoring requirements similar to those of the NPDES wastewater program; however, the primary difference is that the treated effluent is not discharged to surface waters. Non-discharge wastewater disposal options include irrigation (spray or drip), high-rate infiltration, low-rate infiltration, and evaporative systems. Non-discharge residual disposal includes dedicated and non-dedicated residual disposal sites, and agricultural land for crops not consumed by humans. Residuals are also available to the public as fertilizer for home use. During the application process, steps must be taken to assure that residuals are applied at or below agronomic rates based on the soil and crop type. If the application is over agronomic rates, the residuals must be taken to a dedicated residual disposal site or landfill. In addition to land application of residuals and treated effluent, the NDB is also responsible for permitting facilities for the beneficial use of reclaimed water for the purpose of conserving the state's potable, ground, and surface water resources. In the Chowan River Basin, there are 16 permitted wastewater irrigation facilities, and four facilities that are permitted to land apply residuals (Table 7-2). Most, if not all of the treatment components at these facilities are of advanced age and are primarily managed by small towns with limited funds.

Table 7-2 NPDES Non-Discharge Permits – Chowan River Basin

Permit Number	Facility Name	Owner	County	Permit Type	Permitted Wastewater Treatment System Effluent (GPD)*	8 HUC
WQ0000267	Gates Correctional Center #4130	County of Gates	Gates	Wastewater Irrigation	25,000	03010203

Permit Number	Facility Name	Owner	County	Permit Type	Permitted Wastewater Treatment System Effluent (GPD)*	8 HUC
WQ0000777	Aulander Town - WWTP/Spray Facility	Town of Aulander	Hertford	Wastewater Irrigation	333,510	03010203
WQ0001284	Town of Conway- WWTP	Town of Conway	Northampton	Wastewater Irrigation	150,000	03010204
WQ0001536	Perdue Grain and Oilseed LLC	Perdue Grain and Oilseed LLC	Hertford	Wastewater Irrigation	35,000	03010203
WQ0001602	Town of Winton WWTP	Town of Winton	Hertford	Wastewater Irrigation	585,000	03010204
WQ0001868	Severn Town - WWTP/Spray System	Town of Severn	Northampton	Wastewater Irrigation	62,000	03010204
WQ0002012	Georgia-Pacific Chemicals LLC	Georgia-Pacific Chemicals LLC	Northampton	Wastewater Irrigation	8,450	03010204
WQ0002096	Pinewood Manor Rest Home	Jor Enterprises LLC	Hertford	Wastewater Irrigation	7,500	03010203
WQ0003299	Seaboard Town WWTF/Spray	Town of Seaboard	Northampton	Wastewater Irrigation	134,000	03010204
WQ0003885	Town of Ahoskie WWTP	Town of Ahoskie	Hertford	Wastewater Irrigation	406,000	03010203
WQ0004910	Town of Woodland WWTF	Town of Woodland	Northampton	Wastewater Irrigation	185,000	03010204
WQ0005192	Murfreesboro Hatchery #5	Perdue Foods LLC	Northampton	Wastewater Irrigation	10,909	03010204
WQ0005910	Avoca Farms - Merry Hill	Avoca Inc	Bertie	Wastewater Irrigation	50,000	03010203
WQ0006785	Murfreesboro WWTF	Town of Murfreesboro	Hertford	Wastewater Irrigation	649,610	03010204
WQ0011119	Colerain WWTP	Town of Colerain	Bertie	Wastewater Irrigation	75,000	03010203
WQ0012404	CF Nitrogen Site in Tunis, NC	C F Industries Inc	Hertford	Groundwater Remediation	54,795	03010203
WQ0040672	Stevens Towing - Riverbulk Terminal WWTF	Stevens Towing Co of North Carolina LLC	Chowan	Wastewater Irrigation	12,710	03010203
WQ0036706	Ahoskie WWTP	Town of Ahoskie	Hertford	Land Application of Residual Solids (503)	-	03010203
WQ0001989	Roanoke Rapids Sanitary District	Roanoke Rapids Sanitary District	Northampton	Land Application of Residual Solids (503)	-	03010204
WQ0002368	Town of Weldon	Town of Weldon	Northampton	Land Application of Residual Solids (503)	-	03010203

Permit Number	Facility Name	Owner	County	Permit Type	Permitted Wastewater Treatment System Effluent (GPD)*	8 HUC
WQ0038835	Terra Renewal Services – Mountaire Farms/Tyson Foods	Terra Renewal Services Inc.	Gates	Land Application of Residual Solids	-	03010203
*The Permitted Wastewater Treatment System Effluent (Gallons Per Day - GPD) is the maximum volume of effluent that can be applied using non-discharge methods.						

These facilities are overseen by the NDB and the Regional Offices of the North Carolina Department of Environmental Quality (NCDEQ). Due to the nutrient sensitivity of the waters in the Chowan River basin and the strict effluent limits on discharges, these non-discharge wastewater treatment systems are more common than municipal surface wastewater dischargers. This transition occurred in the 1980's to help prevent eutrophication in the nutrient sensitive waters of the Chowan River Basin. Recently, the frequency of eutrophication events in the surface waters of the Chowan River Basin has evoked interest in all potential sources of nutrients in the basin which include both the wastewater irrigation permitted facilities and the fields which permit land application of residuals.

Wastewater irrigation facility permit owners submit groundwater quality information to the NDB through Groundwater Quality Forms. They also submit effluent quality information through Non-Discharge Monitoring Reports (NDMR) and application rates through Non-Discharge Application Reports (NDAR). In 2013, the 2010 NDMR and NDAR reports were used to develop estimates of the treated wastewater applied to the land surface in each river basin across the state. This study suggests that in order to estimate the amount of nutrients being applied, it would be necessary to add effluent monitoring for total phosphorous and either total nitrogen or nitrate + nitrite and total kjeldahl nitrogen. It would also be necessary for effluent monitoring to occur at least once a month for every month that application takes place (NCDENR, 2013). Since this study the effluent monitoring frequency has not been increased because the frequency is dependent on the environmental permit regulatory requirements. The effluent and groundwater quality monitoring parameters have increased over time as the Effluent Monitoring Policy was revised.

The 16 non-discharge facilities which operate wastewater irrigation systems monitor the effluent applied through spray irrigation systems for ammonia, total kjeldahl nitrogen, and total phosphorus. As of 2020, all wastewater irrigation facilities in the Chowan River Basin monitor total nitrogen, nitrate, and/or nitrite plus nitrate, as well as, ammonia, total kjeldahl nitrogen, and total phosphorus. Changes in sampling parameters were incorporated into individual permits on a rolling basis at the time of permit renewals based on the revised Effluent Monitoring Policy and the Standard Industrial Classification Code. As facilities continue to incorporate additional nutrient parameters into their monitoring, the data they collect will provide necessary information regarding the amount of nitrogen and phosphorus being applied to the land surface to minimize adverse impacts to the surrounding environment.

Alongside the nutrient concentrations in the effluent, the groundwater flowing below these permitted wastewater irrigation facilities is monitored through a system of wells positioned up gradient and downgradient of their irrigation or application fields. The nutrient parameters measured in the groundwater include ammonia and nitrate. As of 2020, nine facilities also include total phosphorus

measurements and one facility is also monitoring for orthophosphate. Nitrite was measured at various facilities with variable timeframes of sampling between 1988 and 2004. Total kjeldahl nitrogen was sampled at two facilities in 1990 and 1991. Currently, total nitrogen, nitrite, and total kjeldahl nitrogen are not monitored in the groundwater under the wastewater irrigation facilities in the Chowan River Basin. By continuing to increase the nutrient parameters measured in the groundwater the facility owners and NCDEQ can be alerted to possible elevated nutrient concentrations in the underlying groundwater either up gradient or downgradient of their application fields.

In many monitoring wells, the nitrate and ammonia concentrations are below the 15A NCAC 02L and Interim Maximum Allowable Concentrations for groundwater of 10 mg/L and 1.5 mg/L, respectively. Although groundwater concentrations below many of these wastewater irrigation facilities adhere to groundwater standards, a few facilities have observed concentrations above these standards in groundwater around the facilities. It is recommended that the NCDEQ Regional Offices, supported by their discretion, split samples with a few specific Non-Discharge facilities during a compliance visit and analyze the samples for nutrient parameters. These parameters could include total phosphorous, total nitrogen, nitrate, and total kjeldahl nitrogen. In addition to split sampling, it is encouraged that NCDEQ continue to support and expand the ambient monitoring of groundwater in the Chowan River Basin and statewide through the Ground Water Management Branch. Should potential exist to expand the coastal ambient observation monitoring well network, consideration should be given to locate wells in strategic locations in proximity to surface waters. Such locations may provide a method to improve predictive modelling efforts related to groundwater discharges to the surface water system. By continuing to increase the monitoring of nutrients in both the ambient groundwater and at the wastewater irrigation facilities a more comprehensive understanding of the nutrients in the groundwater can be ascertained across the Chowan River Basin. Following up and implementing best management practices in the areas contributing significant nutrients could then help protect groundwater and ultimately surface water.

It is important to note that there is a direct connection between groundwater and surface water in many places. Non-discharge systems work well when the site is conducive to infiltration. However, problems can arise when the site is a low-lying area with a high groundwater table (thereby inhibiting infiltration), or with nearby wetlands or ditches that can act as a ready conduit for runoff. Most non-discharge wastewater irrigation sites have lagoons which start the treatment process and allows the wastewater to be held until conditions are appropriate to spray. If the water table is high in an application field, water level meters are installed to prevent irrigation until there is a certain vertical separation between the land surface and the water table. Runoff is a potential concern at any irrigation site, but it can be prevented with proper hydraulic loading (water balance), buffering, and storage. All of the facilities in the Chowan River basin have the potential to cause impacts to surface or groundwater. Although potential may exist for groundwater and surface water impacts to occur from Non-Discharge operations, there are few facilities where routine run-off occurs from the spray fields, no routine cases of nutrient over-application occurring based on monitoring data, nor widespread groundwater impacts attributable to wastewater management operations. It is recommended that research be conducted to better establish and understand the relationship between groundwater and surface water in the Chowan River basin. Such understanding would provide for more accurate assessment of surface water impairments resulting from groundwater discharges in the Chowan River basin and enable the state to make sound permitting judgments and recommendations to better protect ground and surface water quality.

7.1.3.1 Groundwater Remediation Non-Discharge Permitting

C. F. Industries Inc. is the only groundwater remediation non-discharge permitted facility (Table 7-2). This permitted facility operates a groundwater recovery system to remove nitrogen-enriched groundwater near the Chowan River. The nitrogen-enriched groundwater site was previously the location of a fertilizer company which produced ammonia, nitric acid, urea, ammonium nitrate, nitrogen solutions and nitrogen-phosphorus-potassium fertilizer (NCDEM, 1979). Additional details regarding C. F. Industries Inc. can be found in the [Chowan River Restoration Project document](#). The Chowan River Restoration Project proposed the installation of a slurry trench wall around the main plant site (NCDEM, 1979). Currently, this property is permitted under the [Ground Water Resources Section](#) and continues operate the groundwater recovery system at the site. The site monitors the groundwater to ensure overtopping of the slurry wall and migration of the nitrogen-enriched groundwater is minimized. Analysis of the nitrogen-enriched groundwater occurs every 90 days, and the analysis includes nitrate-nitrite, ammonia, total kjeldahl nitrogen, and phosphorus. The groundwater from the site is pumped and hauled to land application sites in Bertie, Northampton and Hertford which use the nitrogen-enriched water for irrigation. These land application sites maintain their application rates at or below agronomic rates to where no discharge will occur to surface waters.

7.1.3.2 Non-Discharge Permitted Facilities Best Management Practices

The protection of surface water resources is considerably easier to than a groundwater resources since a permitted facility which directly discharges to a surface water can be removed and the water quality will be restored within a few days or months, but once groundwater is impacted by a discharger it can take hundreds to thousands of years to restore water quality (Curran, 1973). Minimizing the adverse environmental impacts from irrigation relies on proper management of irrigation application rates, timing of irrigation, setbacks/isolation, wastewater constituents, and irrigation system performance (NCDENR, 2015). Alongside the proper management of irrigation best management practices should be implemented when and where appropriate. As stated previously, many of these systems are run by small towns with tight budgets. As a result, several systems have not been able to deal with long-term compliance problems. As funding permits, NCDEQ should work with these towns through the Division of Water Infrastructure to upgrade the water and wastewater infrastructure and reduce potential impacts to the Chowan River basin. Please refer to Chapter 6 which includes a list of the Division of Water Infrastructure grants.

Setting realistic yield goals/expectations, controlling erosion, managing water flow, preserving buffer strips and using appropriate crops are just a few best management practices. The use of appropriate crops is detailed as “deep rooted crops, including alfalfa and to a lesser extent soybean, will scavenge nitrates that leach past the usual soil rooting zone. Used in crop rotation following shallow rooted or heavily fertilized row crops, deep-rooted crops will recover excess nitrate from the soil and reduce the amount of nitrate available for leaching to groundwater.” (NCDENR, 2015). A complete list of best management practices can be found in the [NC WPCSOCC Surface Irrigation System Operators Training Manual](#). Additionally, tools such as the [realistic yield expectation calculator](#) are available via North Carolina State University.

7.1.4 On-Site Wastewater Treatment Systems (Septic Systems)

Instead of being sent to a wastewater treatment facility, wastewater from many households is treated on-site through the use of an on-site wastewater treatment system, more commonly referred to as a septic system. Poorly planned and/or maintained septic systems can fail and contribute to nonpoint

source pollution. Wastewater from failing septic systems can contaminate ground and surface water. Failing septic systems are also health hazards and are considered illegal discharges when surface water is impacted.

A NPDES general permit is required if a septic system discharges less than 1,000 gallons per day (gpd) to surface waters. The general permit ([NCG550000](#)) allows the discharge of treated domestic wastewater to surface waters. Effluent limits must be met as part of the permit and monitoring is required on an annual basis. Additional provisions may also be included in the permit. There are no general permits issued for on-site wastewater treatment systems in the Chowan River basin.

For all systems with a discharge greater than 3,000 gallons per day (gpd), system layout, plans and specifications must be reviewed and approved by the State. Guidance for determining the minimum design daily flow for domestic sewage is provided in administrative code ([15A NCAC 18A .1949](#)).

The [On-Site Water Protection Branch \(OSWB\)](#) in the Environmental Health Section (EHS) of the Division of Public Health (DPH) in the Department of Public Health and Human Services (DHHS) is responsible for providing regulatory oversight of sub-surface on-site wastewater and dispersal systems as well as inspecting and testing the construction, repair or abandonment of a private drinking water well on or after July 1, 2008. OSWB provides statewide regulatory and consultative services related to both wastewater and private drinking water wells to local health departments as well as number of other clients including: builders, developers, landowners, system installers, well drillers, system operators, engineers, soil scientists, geologists, and environmental health consultants.

Information about the proper installation and maintenance of septic tanks can be obtained by contacting OSWB or county health departments. OSWB also has a [Non-Point Source \(NPS\) Pollution Program](#) that identifies potential NPS pollution from on-site systems as well as best management practices to ensure an on-site system is functioning properly. The program also has county statistics on the number of households using septic systems. The facts and figures are based off of the 1990 Census; the 2000 and 2010 Census did not include questions about septic system information. In the Chowan River basin, it was determined that more than 50 percent of the residents in all counties were using septic systems to dispose of domestic waste. Gates County had the greatest amount of septic systems at 88 percent (Table 7-3).

Table 7-3 Number of Septic Systems in the Chowan River Basin (based on 1990 Census data)

County	Area (mi ²)	Total Population	Sewage Disposal (Housing Units)			Sewer Usage (%)	Septic Usage (%)	Potential N (lbs./yr.)
			Sewer	Septic	Other			
Bertie	343.82	11,603	752	3,441	325	16.64	76.16	92,665
Chowan	172.64	13,506	2,310	3,467	133	39.09	58.66	80,368
Gates	340.63	9,305	82	3,266	348	2.22	88.37	90,972
Hertford	353.67	22,523	3,639	4,799	432	41.03	54.1	134,727
Northampton	354.86	17,961	2,556	4,506	432	34.11	60.13	116,975
Total	1665.61	74,358	9,339	19,479	1670			515,707

Local health departments are responsible for ensuring that new septic systems are sited and constructed properly, and an adequate repair area is available. Understanding the potential economic and human

health ramifications caused by failing septic systems can help county, town and city planners plan for long-term septic system sustainability.

7.2 Wetland and Buffer Transportation Permitting Programs

The [401 & Buffer Permitting Branch](#) is responsible for permitting impacts to wetlands and streams as per the federal Nationwide permitting program and permitting impacts to isolated wetlands. The number 401 refers to Section 401 of the CWA. A 401 certification confirms that a project will not degrade waters of the state or violate state water quality standards. The certificate is required for any federally permitted or licensed activity that may result in streambed, streambank or wetland disturbance. This includes activities such as damming a stream channel to create a pond or lake, bank stabilization, or placing material in a stream, wetland or open water, or draining a wetland. Examples include culvert installation, utility lines, dams, dikes or artificial islands. The program also regulates compensatory mitigation (Division of Mitigation Services (DMS), Private Mitigation Banks, and Permittee Responsible), buffer mitigation, and the nutrient offset, as well as, compliance and enforcement. The majority of NC Department of Transportation (NCDOT) mitigation comes from DMS. The branch permits buffer impacts but a number of municipalities also have the authority from the state to regulate buffer impacts. [Interactive projects maps](#) apply to all permitted 401 and buffer projects, including transportation and can be found on the [branch's website](#).

Working closely with the DOT, the [Transportation Permitting Branch](#) is responsible for implementing "North Carolina's waters, wetlands and riparian buffer regulatory programs" for all transportation projects. This includes any enforcement and compliance with those projects. They assist with the scoping and planning process through the Merger process to ensure water quality is protected. They are responsible for the permitting. The mitigation regulated is generally on-site. The branch reviews 401 certificate applications and on-site wetland and stream mitigation plans associated with road projects. The branch also houses the headwater stream spatial dataset. Documents related to NCDOT projects which include buffer impacts, stream determinations, mitigation and 401 certifications as well as 401 stormwater management plans are available through DWR's Document Management System which is available on the [Transportation Permitting Branch's website](#).

7.3 Division of Coastal Management

The [Division of Coastal Management](#) (DCM) protects, conserves, and manages North Carolina's coastal resources through planning, permitting, education and research. DCM carries out the [NC Coastal Area Management Act](#) (CAMA), the [NC Dredge and Fill Act](#) and the [Federal Coastal Zone Management Act of 1972](#) in the 20 coastal [CAMA Counties](#). DCM protects coastal North Carolina resources designated as Areas of Environmental Concern (AECs) through their permitting program with rules established by the [Coastal Resource Commission](#). There are four categories of AECs: (1) the Estuarine and Ocean System, (2) the Ocean Hazard Areas, (3) Public Water Supplies, and (4) Fragile Natural Resource Areas.

Most of North Carolina's existing AECs fall into the first two categories. The DCM permitting program issues three types of permits to protect AECs. These include Major, Minor, and General permits. Impacts to Coastal Wetlands as defined by [15A NCAC 07H. 0205](#) require a CAMA permit in addition to the 401 and 404 permits. So as not to duplicate efforts, DCM generally takes the lead for the state on determining impacts and compensatory mitigation requirements for impacts to Coastal Wetlands.

7.4 Stormwater Programs

Stormwater runoff is a primary carrier of nonpoint source pollution and is a particular concern in the agricultural based Chowan River basin. Previous hydrologic alterations of the landscape have ditched and channelized the land to improve drainage. Stormwater currently moves quickly off the land bypassing swamps and enters directly into creeks and rivers untreated. The impact of stormwater runoff is also severe in developing areas where recently graded lands are highly susceptible to erosion. Water quality impacts are also evident in urbanized areas where stormwater runoff is increased by impervious surfaces and is rapidly channeled through ditches, curb and gutter systems into nearby waterbodies.

The goal of the [NC Division of Energy, Minerals and Land Resources \(DEMLR\)](#) stormwater programs is to prevent pollution from entering the waters of the state via stormwater runoff. The [Stormwater Permitting Program](#) develops, plans and implements statewide stormwater control policies, strategies and rules designated to protect surface waters. The program handles permitting for industrial, municipal and post-construction (development) projects and provides technical assistance to communities, engineers, industry, citizens, and local governments. Stormwater control programs include those required under NPDES, Post-Construction, and Water Supply Watersheds. DEMLR maintains an [interactive web-based map](#) to help the public determine whether development activities are subject to the post-construction permitting program or other stormwater permitting requirements. A tutorial and guidance documents are also available for interpreting the map.

Currently, there are 25 NPDES stormwater permits issued in the Chowan River basin (Table 7-4). North Carolina has 21 different [industrial general permits](#) that cover stormwater discharge associated with industrial activities and construction. Industries that are eligible for one of the general permits are issued a Certificate of Coverage (COC). Industries that are not eligible for a general permit are required to obtain an [individual permit](#). A map is available [online](#) to assist the public in finding facilities or projects with stormwater permits.

Table 7-4 NPDES Stormwater Permits – Chowan River Basin

Permit Number	Facility Name	Owner Type	County Name	Permit Type
NCG020417	Union Sand and Gravel Inc	Non-Government	Hertford	Mining Activities Stormwater Discharge COC
NCG020476	Newsome #2 Pit	Non-Government	Northampton	Mining Activities Stormwater Discharge COC
NCG020811	Eure Sand Mine	Individual	Gates	Mining Activities Stormwater Discharge COC
NCG020824	Cofield Mine	Non-Government	Hertford	Mining Activities Stormwater Discharge COC
NCG020836	Copperneck Sand Hole Mine	Non-Government	Chowan	Mining Activities Stormwater Discharge COC
NCG020892	Joseph Parrish Mine	Non-Government	Chowan	Mining Activities Stormwater Discharge COC

Permit Number	Facility Name	Owner Type	County Name	Permit Type
NCG030135	Alfiniti, Inc.	Non-Government	Hertford	Metal Fabrication Stormwater Discharge COC
NCG050017	Berry Plastics	Non-Government	Hertford	Apparel/Printing/Paper/Leather/Rubber Stormwater Discharge COC
NCG060343	Severn Peanut Company, Inc	Non-Government	Northampton	Food/Tobacco/Soaps/Cosmetics/Public Warehousing Stormwater Discharge COC
NCG080126	A T Byrum & Son Incorporated	Non-Government	Hertford	Transportation w/Vehicle Maintenance/Petroleum Bulk/Oil Water Separator Stormwater Discharge COC
NCG080134	Pilot Travel Centers LLC #68	Non-Government	Northampton	Transportation w/Vehicle Maintenance/Petroleum Bulk/Oil Water Separator Stormwater Discharge COC
NCG080762	North Carolina and Virginia Railroad	Non-Government	Hertford	Transportation w/Vehicle Maintenance/Petroleum Bulk/Oil Water Separator Stormwater Discharge COC
NCG080887	Ahoskie Bin	Non-Government	Hertford	Transportation w/Vehicle Maintenance/Petroleum Bulk/Oil Water Separator Stormwater Discharge COC
NCG100032	Goodnews Auto Sales & Salvage	Non-Government	Bertie	Used Motor Vehicle Parts Stormwater Discharge COC
NCG100130	Liverman's Automotive Inc	Individual	Hertford	Used Motor Vehicle Parts Stormwater Discharge COC
NCG100239	Ahoskie Pull Parts	Non-Government	Hertford	Used Motor Vehicle Parts Stormwater Discharge COC
NCG140102	Commerical Ready Mix Products	Non-Government	Hertford	Ready Mix Concrete Stormwater/Wastewater Discharge COC
NCG140331	Ready Mix Inc - Roanoke-Chowan	Non-Government	Bertie	Ready Mix Concrete Stormwater/Wastewater Discharge COC
NCG150063	Tri-County Airport	Non-Government	Bertie	Air Transportation Stormwater Discharge COC
NCG160206	Winton Asphalt Plant	Non-Government	Hertford	Asphalt Paving Mixture Stormwater Discharge COC

Permit Number	Facility Name	Owner Type	County Name	Permit Type
NCG210078	Seaboard Lumber Mill	Non-Government	Northampton	Timber Products Stormwater Discharge COC
NCG210185	Ashton Lewis Lumber Company	Non-Government	Gates	Timber Products Stormwater Discharge COC
NCG210360	Carolina Bark Products	Non-Government	Northampton	Timber Products Stormwater Discharge COC
NCG210420	Enviva Pellets Ahoskie LLC	Non-Government	Hertford	Timber Products Stormwater Discharge COC
NCS000134	Avoca Farms - Merry Hill	Non-Government	Bertie	Stormwater Discharge, Individual

7.5 Animal Operations

DWR's [Animal Feeding Operations \(AFO\) Program](#) is responsible for permitting and compliance activities of animal feeding operations across the state. Animal operations are defined by General Statute 143-215.10B as feedlots having more than 250 swine, 100 confined cattle, 75 horses, 1,000 sheep or 30,000 poultry with a liquid waste management system. All permitted animal operations are required to have a Certified Animal Waste Management Plan (CAWMP). The CAWMP is developed by a Certified Technical Specialist and is incorporated into the permit.

There are many deemed permitted operations across the state. Operations considered deemed permitted have fewer animals than the state requires to obtain a permit or have a waste management system that does not require a state or federal permit. Poultry operations that use dry-litter poultry waste systems are examples of operations that are deemed permitted. Owners or operators of dry-litter poultry waste facilities are, however, required to adhere to rules set forth under 15A NCAC 02T .1303 and [General Statute 143-215.10C](#) which include minimum stream setbacks, land application rates, soil analysis, and recordkeeping. There are 40 permitted animal operations in the Chowan River basin, all of which are swine (Table 7-5). Several poultry operations are located in the basin as well, but these facilities are deemed permitted. More information about animal feeding operations can be found on the program's [website](#).

Table 7-5 Animal Feeding Operation (AFO) Permits – Chowan River Basin (2020)

Permit Number*	Facility Name	Combined Owner	County Name	HUC	Watershed Name	Number of Lagoons
AWS080010	Farm 35 & 33	Murphy-Brown LLC	Bertie	0301020303	Ahoskie Cr	4
AWS210002	Billy R. Nixon Farm	Billy Nixon	Chowan	0301020306	Holiday I.-Chowan R	1
AWS210004	Stallings Family Farm	Cheryl Stallings	Chowan	0301020306	Holiday I.-Chowan R	2
AWS210006	Michael Nixon Farm	Michael Nixon	Chowan	0301020307	Chowan R	1

Permit Number*	Facility Name	Combined Owner	County Name	HUC	Watershed Name	Number of Lagoons
AWS210015	Curtis Byrum Farm	Curtis Byrum	Chowan	0301020306	Holiday I.-Chowan R	3
AWS370003	George Lang Farm	George Lang	Gates	0301020305	Bennetts Cr	1
AWS370004	BHI3	Michael McPherson	Gates	0301020305	Bennetts Cr	1
AWS370006	Indian Neck Hog & Poultry Farm	William Rountree	Gates	0301020305	Bennetts Cr	2
AWS370012	Byrum Farm	Wayne Byrum	Gates	0301020305	Bennetts Cr	1
AWS370015	Paul Lilley Farm	Paul Lilley	Gates	0301020302	Sarem Cr-Chowan R	2
AWS370059	Sarem Farms, Inc.	Sarem Farms Inc	Gates	0301020302	Sarem Cr-Chowan R	2
AWS460003	DBA Merritt Farms	Donald Merritt	Hertford	0301020304	Wiccacon R	1
AWS460004	Lena Lowe Farm	Lena Lowe	Hertford	0301020306	Holiday I.-Chowan R	1
AWS460007	Farm 40	Murphy-Brown LLC	Hertford	0301020303	Ahoskie Cr	2
AWS460015	Brian Mitchell Farm	Brian Mitchell	Hertford	0301020306	Holiday I.-Chowan R	1
AWS660084	Plantation Sow Farm	Maxwell Foods LLC	Northampton	0301020303	Ahoskie Cr	3
AWI660009	Williams Farms	Williams Farms of NC Inc	Northampton	0301020407	Fontaine Cr	2
AWS460006	Farm 8134	Murphy-Brown LLC	Hertford	0301020408	Potecasi Cr	1
AWS460009	Farm 31	Murphy-Brown LLC	Hertford	0301020408	Potecasi Cr	2
AWS460011	Farm 8525 & 8526	Murphy-Brown LLC	Hertford	0301020408	Potecasi Cr	4
AWS660005	Farm 40 A & 40B	Murphy-Brown LLC	Northampton	0301020409	Tarrara Cr-Meherrin R	3
AWS660011	Farm 39	Murphy-Brown LLC	Northampton	0301020407	Fontaine Cr	2
AWS660014	Blue Rose 3	Blue Rose Inc	Northampton	0301020408	Potecasi Cr	1
AWS660022	Farm 8532	Murphy-Brown LLC	Northampton	0301020409	Tarrara Cr-Meherrin R	1
AWS660023	Farm 8537	Farm 37 LLC	Northampton	0301020408	Potecasi Cr	2
AWS660027	Wheeler Farm	William Wheeler	Northampton	0301020408	Potecasi Cr	3
AWS660030	Farms 27-30	Murphy-Brown LLC	Northampton	0301020407	Fontaine Cr	8
AWS660034	Farm 11 / 8511	Murphy-Brown LLC	Northampton	0301020409	Tarrara Cr-Meherrin R	2

Permit Number*	Facility Name	Combined Owner	County Name	HUC	Watershed Name	Number of Lagoons
AWS660039	Long's Hog Farm	James Long	Northampton	0301020408	Potecasi Cr	1
AWS660040	Barrow East	Jimmy Barrow	Northampton	0301020408	Potecasi Cr	1
AWS660041	Blue Rose 4	Blue Rose Inc	Northampton	0301020408	Potecasi Cr	1
AWS660049	Jenkins Farm	Autrey Jenkins	Northampton	0301020408	Potecasi Cr	1
AWS660051	DMJ Farm	Dmj Group LLC	Northampton	0301020408	Potecasi Cr	2
AWS660055	DMJ Farms 2	Dmj Group LLC	Northampton	0301020408	Potecasi Cr	2
AWS660058	Mike Lassiter Farm	Michael Lassiter	Northampton	0301020408	Potecasi Cr	2
AWI660059	Greg Taylor Farm	Gregory Taylor	Northampton	0301020408	Potecasi Cr	2
AWS660077	Farms # 91 / 8091	Murphy-Brown LLC	Northampton	0301020408	Potecasi Cr	2
AWS660078	Winnaway Farm	Wee Winn LLC	Northampton	0301020408	Potecasi Cr	3
AWS210022	Beaver Swamp Hog	Ivey Ward	Chowan	0301020306	Holiday I.-Chowan R	
AWI370037	Lawrence Farms	Lawrence M	Gates	0301020302	Sarem Cr-Chowan R	

*Permit Type: AWS – Swine State COC, AWI – Animal Individual State Permit

7.6 Water Use

7.6.1 Public Water Systems

It is the responsibility of DWR's [Public Water Supply Section \(PWSS\)](#) to regulate public water systems (PWS) within the state under the authority of General Statute 130A Article 10: North Carolina Drinking Water Act. Public water systems (PWS) are those that provide piped drinking water to 15 or more service connections or 25 or more people for 60 or more days per year (Table 7-6). A PWS is identified by the number of people served or number of connections and the number of days or months of the year that the population is served.

Table 7-6 Types of Public Water Supply Systems (PWS)

Public Water Supply (PWS) Type	Description
Community	Regularly serves 25 or more year-round residents or has 15 or more connections. Examples include subdivisions, mobile home parks, prisons and assisted living centers.
Non-Transient Non-Community	Serves at least 25 of the same persons 6 or more months per year. Examples include schools, daycares and industries.
Transient Non-Community	Serves 25 or more people at any given time at least 60 days per year. Examples include restaurants, gas stations, rest areas and campgrounds.

7.6.2 Source Water Assessment Program (SWAP)

Pollution prevention is recognized as the most effective approach for ensuring a reliable, long-term and safe public drinking water supply. The Safe Drinking Water Act (SDWA) amendments of 1996 required that all states establish a [Source Water Assessment Program](#) (SWAP). SWAP allows the state to systematically identify potential contaminants and delineate source water protection areas by using existing data from established federal and state environmental programs.

The primary goal of SWAP is to protect public drinking water supplies. [Detailed assessments](#) of all public drinking water intakes are available for review and can be used as a planning tool to protect public drinking water sources. An [interactive map](#) is also available which provides general information about the water source and its susceptibility rating. The susceptibility rating is based on a contaminant rating and an inherent vulnerability rating and indicates the potential for a drinking water source to become contaminated. It should be noted that the susceptibility rating is not an indicator of water quality, but rather, the potential for a water source to be impacted by the identified contaminants within the assessment area.

7.6.3 Wellhead Protection (WHP) Program

In 1986, amendments to the Safe Drinking Water Act (SDWA) established requirements for states to develop [Wellhead Protection](#) (WHP) programs. WHP programs were intended by Congress to be a key part of a national ground water protection strategy to prevent contamination of groundwater used for public drinking water supplies. In North Carolina, development of a local WHP plan is not mandatory but is encouraged and viewed as a valuable supplement to existing ground water protection programs. North Carolina's program is intended for city and county governments and water supply operators who wish to provide added protection to their local ground water supplies. The WHP plan identifies the wellhead protection area (WHPA). A WHPA is defined as "the surface and subsurface area surrounding a water well or wellfield, supplying a public water system, through which contaminants are reasonable likely to move toward and reach such water well or wellfields." Once implemented, the WHP plan reduces, but does not eliminate, the susceptibility of wells to contaminants. Currently, The Towns of Ahoskie, Aulander, Cofield, Conway, Jackson, Powellsville, Rich Square, and Winton have wellhead protection plans in place.

7.6.4 Local Water Supply Plans (LWSP)

Under General Statute 143-355(I), local governments that provide public water service are required to prepare [local water supply plans](#) (LWSP). All community water systems that have 1,000 or more service connections or serve more than 3,000 people on a regular basis are also required to prepare a LWSP. The LWSP is an assessment of a water system's current and future water needs and its ability to meet those needs. By understanding current and future needs, local governments and community systems will be able better able to manage water supplies, plan for future growth, and prepare for system improvements. Data in the LWSP is entered by the Public Water Supply System (PWSS) and includes information about population, population projections, water supply and demand. The PWS reports water usage annually to DWR and updates the LWSP at least every five years.

Eighteen PWS's are required to submit a LWSP. Combined, the PWS's supplied 5.992 millions of gallons (MGD) of water to just over 66,000 people in 2018. Residential demand accounted for 58 percent of the total use. Non-residential demand accounted for 26 percent. The remaining 16 percent was used for system processes (cleaning and flushing waterlines, backwash, etc.) or is unaccounted-for. More information about LWSPs can be found in Chapter 8.

7.6.5 Water Withdrawal & Transfer Registration

[General Statute 143-215.22H](#) requires that any non-agriculture person or entity who withdraws 100,000 gallons or more of water per day from surface water or groundwater or who transfers 100,000 gallons or more of water per day from one river basin to another register the withdraw or transfer with the Environmental Management Commission. Any agricultural water users that withdraw or transfer 1,000,000 gallons or more of surface water or groundwater per day must also register the withdraw or transfer. The withdrawal or transfer can be registered through the Water Withdrawal & Transfer Registration (WWATR) program administered through DWR. Under administrative rule ([15A NCAC 02E .0604](#)), registrants must report monthly average water use in million gallons per day (MGD) on an annual basis.

Twenty-three facilities withdraw a combined 3.241 MGD over the course of a year with the majority being used for row crop farming and research (Table 7-7). Registered withdrawers include 19 row-crop farming and research uses, two mining (mineral extraction) facility, one each industrial facility, and one animal processing facility (Table 7-8).

Table 7-7 Water Withdraw and Transfer Registration (WWATR) in the Chowan River Basin (2018)

HUC	Facility ID	Facility Name	County	Type	Source	Average Annual Use (MGD)
03010204	0235-0001	T. J. Taylor & Sons, Inc.	Northampton	Agricultural	Pond	0.035
					Pond	0.009
					Well	0.011
					Well	0.000
					Well	0.003
03010203	0015-0001	Oakland Farm	Bertie	Agricultural	Pond	0.085
03010203	0015-0003	Quarter Farm	Bertie	Agricultural	River	0.023
03010203	0015-0004	Beasley Farm	Bertie	Agricultural	Pond	0.026
03010203	0015-0005	Cowan Farm	Bertie	Agricultural	Stream	0.071
03010203	0015-0007	Williams Farms	Hertford	Agricultural	River	0.073
03010203	0015-0008	Sharp Farm	Hertford	Agricultural	River	0.057
03010203	0015-0009	Pruden Farm	Hertford	Agricultural	Stream	0.058
03010203	0015-0010	Powell Farm	Hertford	Agricultural	Stream	0.089
03010203	0015-0011	Liberty Hill	Hertford	Agricultural	River	0.016
03010203	0054-0001	Gillam Farms (combined)	Hertford	Agricultural	Pond	0.095
					Pond	0.337
					Pond	0.028
					Pond	0.069
					Pond	0.030
					Pond	0.033
					Pond	0.000
					River	0.000
					River	0.030
					River	0.057
					River	0.107
					River	0.018
					Well	0.036
					Well	0.160

HUC	Facility ID	Facility Name	County	Type	Source	Average Annual Use (MGD)
					Well	0.018
					Well	0.107
					Canal	0.036
03010203	0104-0001	Baughan Farm	Hertford	Agricultural	Pond	0.035
					Well	0.026
03010203	0104-0002	CJ Farm	Hertford	Agricultural	Stream	0.028
03010203	0104-0003	Daniels Farm	Hertford	Agricultural	Pond	0.020
					Well	0.006
03010203	0104-0004	Hill Farm	Hertford	Agricultural	Stream	0.028
					Well	0.019
03010203	0104-0006	Mitchell Farm	Hertford	Agricultural	Well	0.065
03010203	0104-0007	Jilcott Farm	Hertford	Agricultural	Pond	0.020
					Well	0.016
03010203	0230-0002	Cofield Facility	Hertford	Industrial (Animal Processing)	Well	0.141
					Well	0.328
					Well	0.002
03010203	0375-0001	Stuart Pierce Farms, INC.	Hertford	Agricultural	Stream	0.051
03010203	0720-0001	Nucor Steel	Hertford	Industrial	Pond	0.031
					River	0.219
					Well	0.009
					Well	0.114
					Well	0.004
					Well	0.278
					Well	0.020
					Well	0.000
					Well	0.037
					Well	0.011
					Well	0.017
03010203	0851-0001	Wildcat Road Mine	Chowan	Mining	Pond	0.000
03010203	0851-0002	Copperneck Sand Hole Mine	Chowan	Mining	Pond	0.003
03010203	0868-0001	Byrum Farms Inc.	Chowan	Agricultural	Well	0.000
					Well	0.000

Table 7-8 Total Water Use of Registered Withdrawers by Type (2018)

Use Type	Number of Facilities	Ground Water (MGD)*	Surface Water (MGD)*	Total	% Ground Water	% Surface Water	% of Total
Agriculture (Row-Crop Farming/Research)	19	0.275	1.753	2.029	14%	86%	63%
Industrial (Animal Processing)	1	0.471	0.000	0.471	100%	0%	15%
Industrial (Metal/Plastic/Fiberglass Manufacturing)	1	0.735	0.004	0.739	99%	1%	23%
Mining (Mineral Extraction)	2	0.000	0.003	0.003	0%	100%	0%
Total	23	1.481	1.760	3.241	46%	54%	100%

* Annual average ground or surface water used (MGD). Calculated based on the average daily amount and the number of days reported in 2018. Surface water includes canals, ponds, rivers and streams.

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